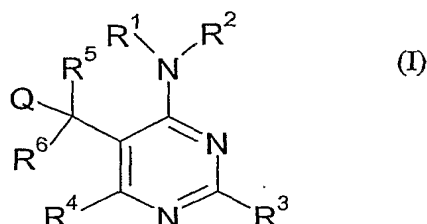


Claims

- 1) The use of benzylpyrimidine derivatives represented by the formula (I) for combating undesired microorganisms in agriculture and horticulture,

5



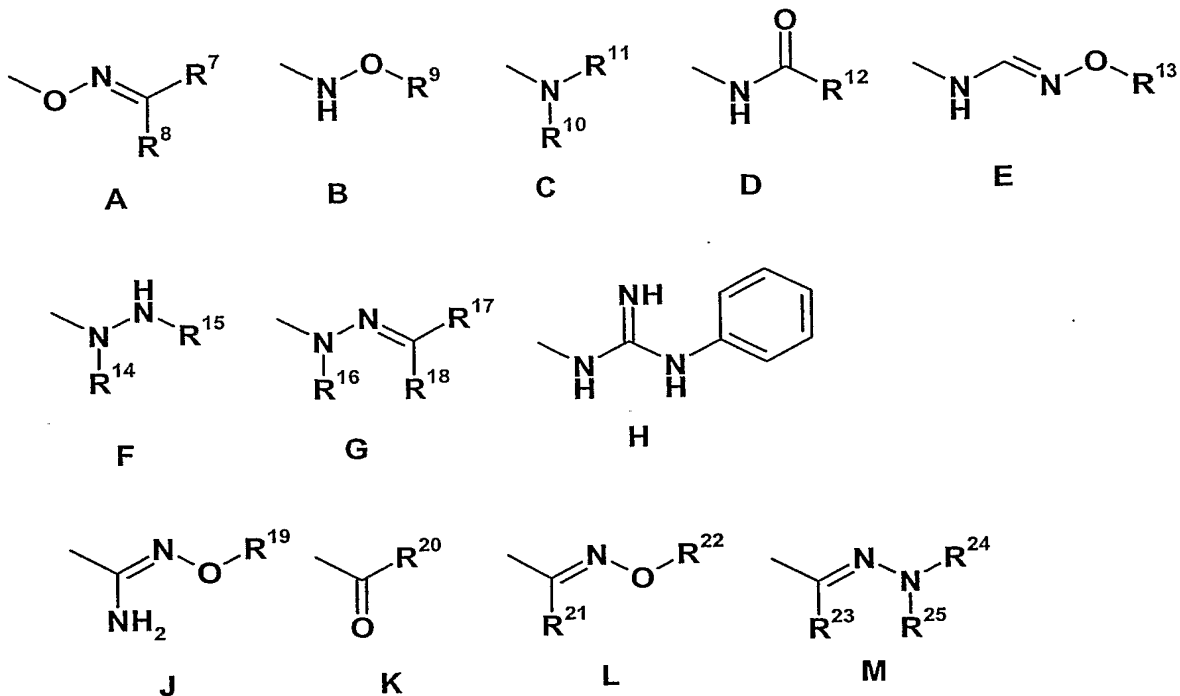
wherein

- 10  $R^1$  and  $R^2$  form, together with the nitrogen atom to which they are bonded, a 3 to 10-membered heterocyclic group that may be optionally substituted, and may contain further one to three hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and  $S(O)_n$ , besides the nitrogen atom to which  $R^1$  and  $R^2$  are bonded,

$n$  represents 0, 1 or 2,

- 15  $R^3$  represents hydrogen, halogen, cyano, hydroxy, amino, azido, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, haloalkoxy, alkenyloxy, haloalkenyloxy, alkylthio, alkenylthio, haloalkenylthio, alkylsulfinyl, alkylsulfonyl, phenoxy that may be optionally substituted, benzyloxy that may be optionally substituted, phenyl that may be optionally substituted, phenylalkyl that may be optionally substituted, phenoxyalkyl that may be optionally substituted, or
- 20 5-10-membered heterocyclic group that contains one to four hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally substituted with a group selected from the group consisting of halogen, alkyl and haloalkyl, or

- 25  $R^3$  represents a group selected from the group consisting of the following groups A-H and J-M



in which

$\text{R}^7$  represents hydrogen atom, alkyl or haloalkyl, and

$\text{R}^8$  represents alkyl, phenyl, alkoxy or cyano, or

5  $\text{R}^7$  and  $\text{R}^8$  form, together with the carbon atom to which they are bonded, cycloalkylidene,

$\text{R}^9$  represents alkyl, haloalkenyl or benzyl,

$\text{R}^{10}$  represents hydrogen atom or alkyl,

$\text{R}^{11}$  represents alkyl, alkoxyalkyl, dialkylaminoalkyl, phenyl, benzyl or cyano,

$\text{R}^{12}$  represents alkyl or phenyl,

10  $\text{R}^{13}$  represents alkyl or benzyl,

$\text{R}^{14}$  represents hydrogen atom or alkyl,

$\text{R}^{15}$  represents hydrogen atom, haloalkyl or phenyl,

$\text{R}^{16}$  represents hydrogen atom or alkyl,

$\text{R}^{17}$  represents hydrogen atom, alkyl or haloalkyl,

15  $\text{R}^{18}$  represents alkyl or phenyl,

R<sup>19</sup> represents hydrogen atom or alkyl,

R<sup>20</sup> represents alkyl,

R<sup>21</sup> represents alkyl,

5 R<sup>22</sup> represents alkyl, alkenyl, haloalkenyl, alkoxyalkyl, phenoxyalkyl or  
alkoxycarbonylalkyl,

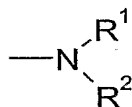
R<sup>23</sup> represents alkyl,

R<sup>24</sup> represents hydrogen atom or alkyl,

R<sup>25</sup> represents alkyl or phenyl,

10 R<sup>24</sup> and R<sup>25</sup> form, together with the nitrogen atom to which they are bonded, a 5 to  
8-membered, saturated, monoheterocyclic group that may be optionally substituted,  
and may contain one or two further hetero atoms selected from the group  
consisting of nitrogen atom, oxygen atom and S(O)<sub>n</sub>, besides the nitrogen atom to  
which R<sup>24</sup> and R<sup>25</sup> are bonded,

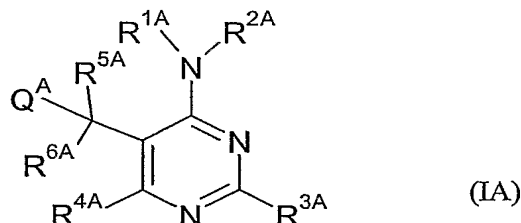
15 R<sup>4</sup> represents hydrogen atom, halogen, cyano, alkyl, haloalkyl, alkenyl, alkynyl,  
alkoxy, haloalkoxy, alkylthio, haloalkylthio, alkylsulfinyl, alkylsulfonyl or group



20 R<sup>5</sup> and R<sup>6</sup> each independently represents hydrogen atom, halogen, alkyl, haloalkyl, or  
phenyl that may be optionally substituted, and

Q represents aryl that may be optionally substituted or a 5 or 6-membered  
heterocyclic group that contains one hetero atom selected from the group  
consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally  
substituted.

2) Benzylpyrimidine derivatives represented by the formula



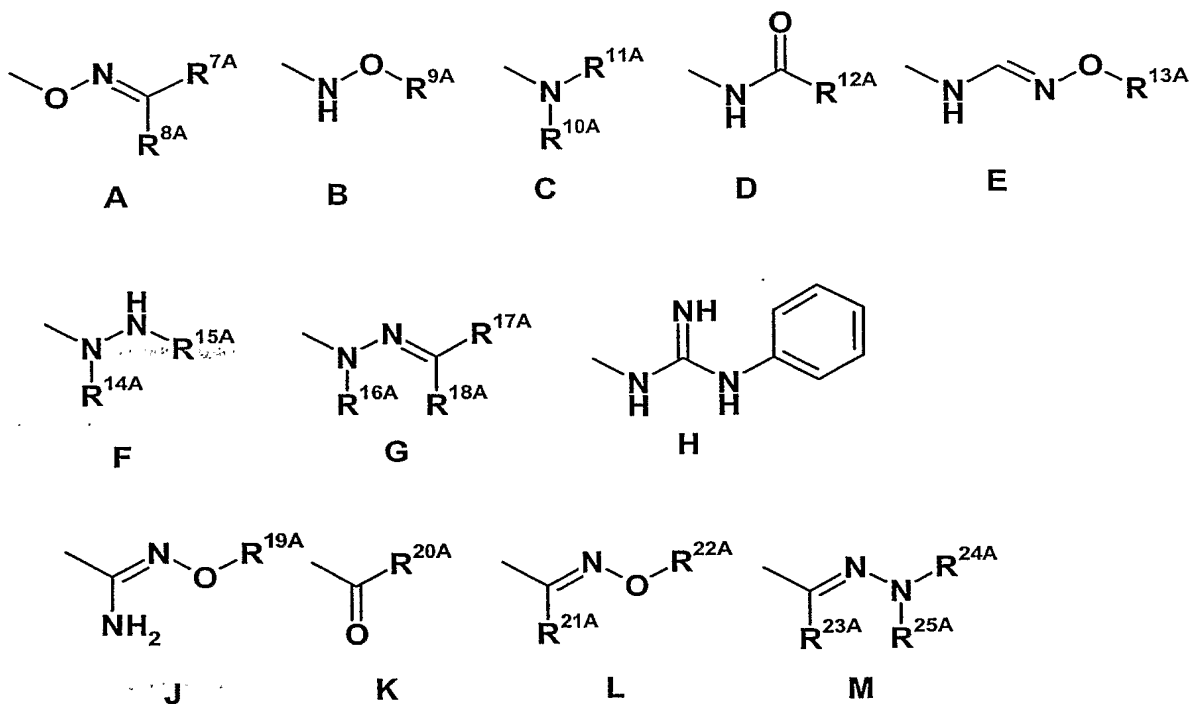
wherein

10  $R^{1A}$  and  $R^{2A}$  form, together with the nitrogen atom to which they are bonded, a 3 to 10-membered heterocyclic group that may be optionally substituted, and may contain one to three further hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and  $S(O)_m$ , besides the nitrogen atom to which  $R^{1A}$  and  $R^{2A}$  are bonded,

$m$  represents 0, 1 or 2,

15  $R^{3A}$  represents hydrogen, halogen, cyano, hydroxy, amino, azido, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, haloalkoxy, alkenyloxy, haloalkenyloxy, alkylthio, alkenylthio, haloalkenylthio, alkylsulfinyl, alkylsulfonyl, phenoxy that may be optionally substituted, benzyloxy that may be optionally substituted, phenyl that may be optionally substituted, phenylalkyl that may be optionally substituted, phenoxyalkyl that may be optionally substituted, or 5 to 20 10-membered heterocyclic group that contains one to four hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally substituted with a group selected from the group consisting of halogen, alkyl and haloalkyl, or

25  $R^{3A}$  represents a group selected from the group consisting of the following groups A-H and J-M



in which

$\text{R}^{7\text{A}}$  represents hydrogen atom, alkyl or haloalkyl, and

$\text{R}^{8\text{A}}$  represents alkyl, phenyl, alkoxy or cyano, or

5  $\text{R}^{7\text{A}}$  and  $\text{R}^{8\text{A}}$  form, together with the carbon atom to which they are bonded, cycloalkylidene,

$\text{R}^{9\text{A}}$  represents alkyl, haloalkenyl or benzyl,

$\text{R}^{10\text{A}}$  represents hydrogen atom or alkyl,

$\text{R}^{11\text{A}}$  represents alkyl, alkoxyalkyl, dialkylaminoalkyl, phenyl, benzyl or cyano,

10  $\text{R}^{12\text{A}}$  represents alkyl or phenyl,

$\text{R}^{13\text{A}}$  represents alkyl or benzyl,

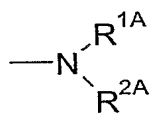
$\text{R}^{14\text{A}}$  represents hydrogen atom or alkyl,

$\text{R}^{15\text{A}}$  represents hydrogen atom, haloalkyl or phenyl,

$\text{R}^{16\text{A}}$  represents hydrogen atom or alkyl,

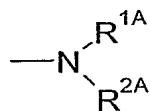
15  $\text{R}^{17\text{A}}$  represents hydrogen atom, alkyl or haloalkyl,

- $R^{18A}$  represents alkyl or phenyl,  
 $R^{19A}$  represents hydrogen atom or alkyl,  
 $R^{20A}$  represents alkyl,  
 $R^{21A}$  represents alkyl,  
 5  $R^{22A}$  represents alkyl, alkenyl, haloalkenyl, alkoxyalkyl, phenoxyalkyl or alkoxycarbonylalkyl,  
 $R^{23A}$  represents alkyl,  
 $R^{24A}$  represents hydrogen atom or alkyl,  
 $R^{25A}$  represents alkyl or phenyl,  
 10  $R^{24A}$  and  $R^{25A}$  form, together with the nitrogen atom to which they are bonded, a 5 to 8-membered, saturated-monoheterocyclic group that may be optionally substituted, and may contain further one or two hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and  $S(O)_n$ , besides the nitrogen atom to which  $R^{24A}$  and  $R^{25A}$  are bonded,  
 15  $R^{4A}$  represents hydrogen atom, halogen, cyano, alkyl, haloalkyl, alkenyl, alkynyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, alkylsulfinyl, alkylsulfonyl or group



- 20  $R^{5A}$  and  $R^{6A}$  each independently represents hydrogen atom, halogen, alkyl, haloalkyl, or phenyl that may be optionally substituted, and  
 $Q^A$  represents aryl that may be optionally substituted, a 5 or 6-membered heterocyclic group that contains one hetero atom selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally substituted,  
 25 provided that, the following cases (T-1)-(T-6) are excluded:

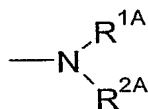
(T-1) the case in which group



- 5 represents 1-pyrrolyl, 1-imidazolyl, 3-oxopiperidino or 4-oxopiperidino,  $R^{3A}$  represents hydrogen atom,  $R^{4A}$  represents hydrogen atom, and  $Q^A$  represents 1-naphthyl or phenyl group that may be optionally substituted by one or two groups selected from the group consisting of chloro, methyl, ethyl and trifluoromethyl,

(T-2) the case in which group

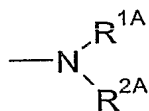
10



- 15 represents 3-oxopiperidino, 4-oxopiperidino, 4-hydroxypiperidino, 4-carbamoylpiperidino, 4-methylpiperazino, 4-ethylpiperazino, 4-(2-hydroxyethyl)piperazino or morpholino,  $R^{3A}$  represents amino,  $R^{4A}$  represents hydrogen atom, and  $Q^A$  represents 3-pyridyl or phenyl group that may be optionally substituted by one to three groups selected from the group consisting of fluoro, chloro, bromo, methyl, ethyl, isopropyl, trifluoromethyl, hydroxy, methoxy and 4-chlorobenzyloxy,

(T-3) the case in which group

20



- 25 represents piperidino, 4-hydroxypiperidino, 4-methylpiperazino, morpholino, 6,7-dimethoxy-1,2,3,4-tetrahydroisoquinolin-2-yl or 6,7-dimethoxy-1-(3,4-dimethoxybenzyl)-1,2,3,4-tetrahydroisoquinolin-2-yl,  $R^{3A}$  represents

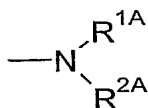
chloro, dimethylamino, anilino, 2-(2-hydroxyethoxy)ethylamino, piperidino, 4-hydroxypiperidino, 4-carbamoylpiperidino, 4-methylpiperazino or morpholino,

$R^{4A}$  represents hydrogen atom, and  $Q^A$  represents phenyl group that may be optionally

substituted by one or two groups selected from the group consisting of methyl and methoxy,

(T-4) the case in which group

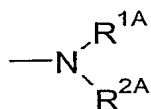
5



represents 1-pyrrolidinyl, piperidino, morpholino or 1-pyrrolyl,  $\text{R}^{3A}$  represents methyl or methoxymethyl,  $\text{R}^{4A}$  represents chloro, and  $\text{Q}^A$  represents phenyl or 1-naphthyl,

(T-5) the case in which group

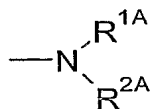
10



represents 1-azilidinyl, piperidino or morpholino,  $\text{R}^{3A}$  represents methylthio,  $\text{R}^{4A}$  represents chloro, and  $\text{Q}^A$  represents phenyl group substituted by methoxy, ethoxy, n-propoxy, iso-propoxy, n-butoxy, iso-butoxy or allyloxy,

15

(T-6) the case in which group



20

represents 1-azilidinyl,  $\text{R}^{3A}$  represents hydrogen atom or amino,  $\text{R}^{4A}$  represents chloro, and  $\text{Q}^A$  represents phenyl group substituted by methoxy, ethoxy or allyloxy.

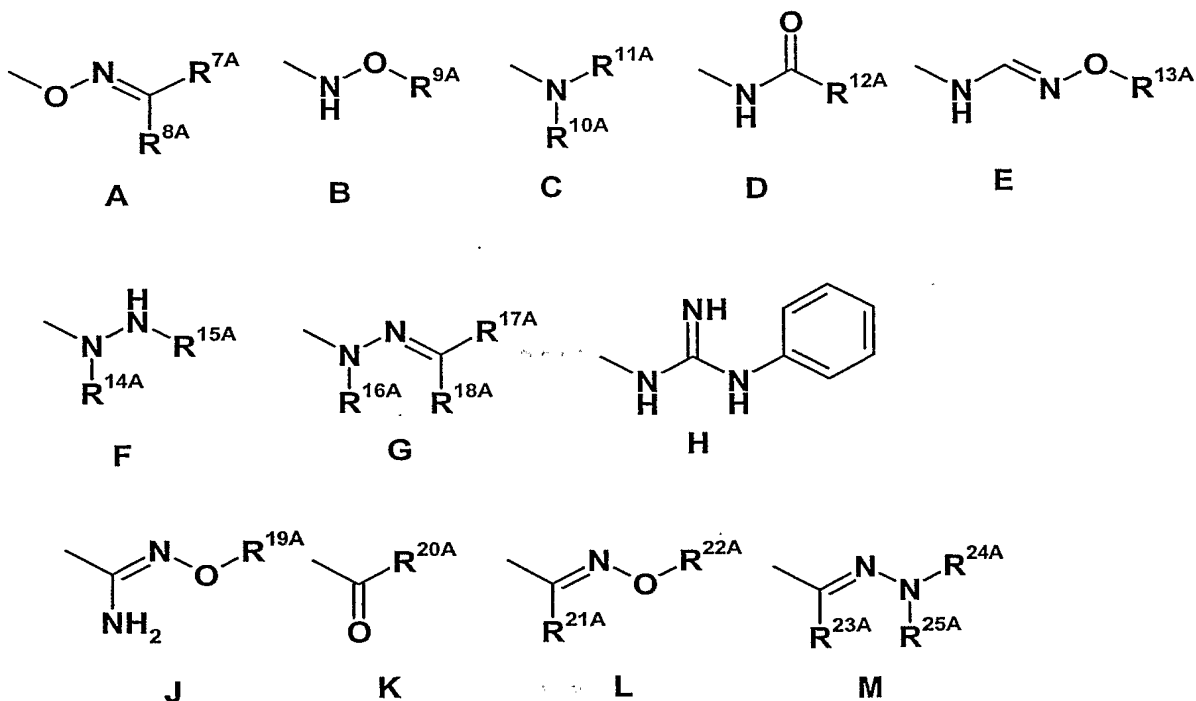
3) Compounds set forth in Claim 2, wherein

25

$\text{R}^{1A}$  and  $\text{R}^{2A}$  form, together with the nitrogen atom to which they are bonded, a heterocyclic group which is a monovalent group derived from a heterocycle selected from the group consisting of aziridine, azetidine, pyrrolidine, 3-pyrroline, piperidine, perhydroazepine, perhydroazocine, perhydro-1,2-diazepine, perhydro-1,2,5-oxa-diazepine, 2-pyrazoline, thiazolidine, perhydroindole, 1,2,3,3a,4,7,7a-hepta-



- hydroisoindole, 1,2,3,6-tetrahydropyridine, perhydroquinoline, perhydroisoquinoline, 1,4,5,6-tetrahydropyridazine, morpholine, thiomorpholine, thiomorpholine-1,1-dioxide, piperazine, pyrrole, pyrazole, imidazole, 1,2,3-triazole, 1,2,4-triazole, tetrazole and 1H-indazole and may be optionally substituted by one to three groups selected from the group consisting of fluoro, bromo, C<sub>1-4</sub>alkyl, C<sub>1-4</sub>haloalkyl, C<sub>1-4</sub>alkoxy, C<sub>1-4</sub>alkylthio, benzylthio, hydroxyC<sub>1-4</sub>alkyl, C<sub>1-4</sub>alkoxyC<sub>1-4</sub>alkyl, anilinoC<sub>1-4</sub>alkyl, C<sub>1-4</sub>haloalkylene, C<sub>1-4</sub>alkoxy-carbonyl, benzyloxycarbonyl, C<sub>1-4</sub>alkyl-carbonyl, C<sub>1-7</sub>haloalkyl-carbonyl, phenyl, benzyl, pyridyl, hydroxy, oxo, cyano, carboxy, carbamoyl, C<sub>1-4</sub>alkoxy-carbonylC<sub>1-4</sub>alkyl, C<sub>1-4</sub>alkyl-carbonylamino and C<sub>1-4</sub>haloalkyl-carbonylamino,
- R<sup>3A</sup>** represents hydrogen, chloro, cyano, hydroxy, amino, azido, C<sub>1-6</sub>alkyl, C<sub>1-6</sub>haloalkyl, C<sub>1-6</sub>alkoxyC<sub>1-6</sub>alkyl, C<sub>3-7</sub>cycloalkyl, C<sub>2-7</sub>alkenyl, C<sub>2-7</sub>alkynyl, C<sub>1-6</sub>alkoxy, C<sub>1-6</sub>haloalkoxy, C<sub>2-7</sub>alkenyloxy, C<sub>2-7</sub>haloalkenyloxy, C<sub>1-6</sub>alkylthio, C<sub>2-7</sub>alkenylthio, C<sub>2-7</sub>haloalkenylthio, C<sub>1-6</sub>alkylsulfinyl, C<sub>1-6</sub>alkylsulfonyl, phenoxy, benzyloxy, phenyl that may be optionally substituted by one or two groups selected from the group consisting of chloro, C<sub>1-6</sub>alkyl, C<sub>1-6</sub>alkoxy and C<sub>1-6</sub>haloalkyl, phenylC<sub>1-4</sub>alkyl that may be optionally chloro-substituted, or phenoxyC<sub>1-4</sub>alkyl that may be optionally chloro-substituted, or
- R<sup>3A</sup>** represents a heterocyclic group which is a monovalent group derived from a heterocycle selected from the group consisting of pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine, thiophene, thiazole, pyridine, quinoline, isoquinoline, pyrazine, pyridazine, pyrimidine, imidazole, pyrazole, tetrazole, 1,2,4-triazole and 2,3-dihydroindole, and may be optionally substituted by a group selected from the group consisting of chloro, bromo, C<sub>1-6</sub>alkyl and C<sub>1-6</sub>haloalkyl, or
- R<sup>3A</sup>** represents a group selected from the group consisting of the following groups A-H and J-M



in which

R<sup>7A</sup> represents hydrogen atom, C<sub>1-6</sub>alkyl or C<sub>1-6</sub>haloalkyl,

R<sup>8A</sup> represents C<sub>1-6</sub>alkyl, phenyl, C<sub>1-6</sub>alkoxy or cyano,

5 R<sup>7A</sup> and R<sup>8A</sup> form, together with the carbon atom to which they are bonded, C<sub>5-8</sub>cycloalkylidene,

R<sup>9A</sup> represents C<sub>1-6</sub>alkyl, C<sub>2-7</sub>haloalkenyl or benzyl,

R<sup>10A</sup> represents hydrogen atom or C<sub>1-6</sub>alkyl,

10 R<sup>11A</sup> represents C<sub>1-6</sub>alkyl, C<sub>1-6</sub>alkoxyC<sub>1-6</sub>alkyl, di(C<sub>1-6</sub>alkyl)aminoC<sub>1-6</sub>alkyl, phenyl, benzyl or cyano,

R<sup>12A</sup> represents C<sub>1-6</sub>alkyl or phenyl,

R<sup>13A</sup> represents C<sub>1-6</sub>alkyl or benzyl,

R<sup>14A</sup> represents hydrogen atom or C<sub>1-6</sub>alkyl,

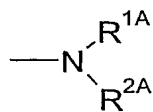
R<sup>15A</sup> represents hydrogen atom, C<sub>1-6</sub>haloalkyl or phenyl,

15 R<sup>16A</sup> represents hydrogen atom or C<sub>1-6</sub>alkyl,

- $R^{17A}$  represents hydrogen atom,  $C_{1-6}$ alkyl or  $C_{1-6}$ haloalkyl,  
 $R^{18A}$  represents  $C_{1-6}$ alkyl or phenyl,  
 $R^{19A}$  represents hydrogen atom or  $C_{1-6}$ alkyl,  
 $R^{20A}$  represents  $C_{1-6}$ alkyl,  
5  $R^{21A}$  represents  $C_{1-6}$ alkyl,  
 $R^{22A}$  represents  $C_{1-6}$ alkyl,  $C_{2-7}$ alkenyl,  $C_{2-7}$ haloalkenyl,  $C_{1-6}$ alkoxy $C_{1-6}$ alkyl, phenoxy $C_{1-6}$ alkyl or  $C_{1-6}$ alkoxycarbonyl $C_{1-6}$ alkyl,  
 $R^{23A}$  represents  $C_{1-6}$ alkyl,  
 $R^{24A}$  represents hydrogen atom or  $C_{1-6}$ alkyl,  
10  $R^{25A}$  represents  $C_{1-6}$ alkyl or phenyl,  
 $R^{24A}$  and  $R^{25A}$  form, together with the nitrogen atom to which they are bonded, a saturated-monoheterocyclic group which is a monovalent group derived from a monoheterocycle selected from the group consisting of pyrrolidine, piperidine, morpholine and piperazine and may be optionally substituted with  $C_{1-4}$ alkyl,  
15  $R^{4A}$  represents hydrogen atom, fluoro, chloro, cyano,  $C_{1-6}$ alkyl,  $C_{1-6}$ haloalkyl,  $C_{2-7}$ alkenyl,  $C_{2-7}$ alkynyl,  $C_{1-6}$ alkoxy,  $C_{1-6}$ haloalkoxy,  $C_{1-6}$ alkylthio,  $C_{1-6}$ haloalkylthio,  $C_{1-6}$ alkylsulfinyl,  $C_{1-6}$ alkylsulfonyl or pyrazolyl that may be optionally  $C_{1-6}$ alkyl-substituted or  $C_{1-6}$ haloalkyl-substituted,  
 $R^{5A}$  and  $R^{6A}$  each independently represents hydrogen atom, fluoro,  $C_{1-4}$ alkyl,  $C_{1-4}$ haloalkyl or phenyl, and  
20  $Q^A$  represents naphthyl, phenyl that may be optionally substituted, pyridyl that may be optionally substituted, thienyl that may be optionally substituted, or furyl that may be optionally substituted, wherein substituents to phenyl, pyridyl, thienyl and furyl are one to five groups selected from the group consisting of fluoro, chloro,  $C_{1-4}$ alkyl,  $C_{1-4}$ haloalkyl,  $C_{1-4}$ alkoxy,  $C_{1-4}$ haloalkoxy, cyano, nitro, amino and  
25 phenyl,

provided that, the following cases (T-1)-(T-6) are excluded:

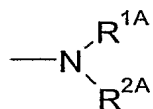
(T-1) the case in which group



5 represents 1-pyrrolyl, 1-imidazolyl, 3-oxopiperidino or 4-oxopiperidino,  $\text{R}^{3A}$  represents hydrogen atom,  $\text{R}^{4A}$  represents hydrogen atom, and  $\text{Q}^A$  represents 1-naphthyl or phenyl group that may be optionally substituted by one or two groups selected from the group consisting of chloro, methyl, ethyl and trifluoromethyl,

(T-2) the case in which group

10

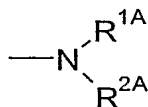


15

represents 3-oxopiperidino, 4-oxopiperidino, 4-hydroxypiperidino, 4-carbamoylpiperidino, 4-methylpiperazino, 4-ethylpiperazino, 4-(2-hydroxyethyl)piperazino or morpholino,  $\text{R}^{3A}$  represents amino,  $\text{R}^{4A}$  represents hydrogen atom, and  $\text{Q}^A$  represents 3-pyridyl or phenyl group that may be optionally substituted by one to three groups selected from the group consisting of fluoro, chloro, methyl, ethyl, isopropyl, trifluoromethyl and methoxy,

(T-3) the case in which group

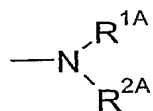
20



25

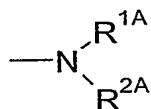
represents piperidino, 4-hydroxypiperidino, 4-methylpiperazino or morpholino,  $\text{R}^{3A}$  represents chloro, dimethylamino, anilino, piperidino, 4-methylpiperazino or morpholino,  $\text{R}^{4A}$  represents hydrogen atom, and  $\text{Q}^A$  represents phenyl group that may be optionally substituted by one or two groups selected from the group consisting of methyl and methoxy,

(T-4) the case in which group



5 represents 1-pyrrolidinyl, piperidino, morpholino or 1-pyrrolyl,  $\text{R}^{3A}$  represents methyl or methoxymethyl,  $\text{R}^{4A}$  represents chloro, and  $\text{Q}^A$  represents phenyl or 1-naphthyl,

(T-5) the case in which group

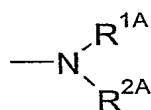


10

represents 1-azilidinyl, piperidino or morpholino,  $\text{R}^{3A}$  represents methylthio,  $\text{R}^{4A}$  represents chloro, and  $\text{Q}^A$  represents phenyl group substituted by methoxy, ethoxy, n-propoxy, iso-propoxy, n-butoxy or iso-butoxy,

(T-6) the case in which group

15



represents 1-azilidinyl,  $\text{R}^{3A}$  represents hydrogen atom or amino,  $\text{R}^{4A}$  represents chloro, and  $\text{Q}^A$  represents phenyl group substituted by methoxy or ethoxy.

20 4) Compounds set forth in Claim 2, wherein

$\text{R}^{1A}$  and  $\text{R}^{2A}$  form, together with the nitrogen atom to which they are bonded, a heterocyclic group which is a monovalent group derived from a heterocycle selected from the group consisting of aziridine, azetidine, pyrrolidine, 3-pyrroline, piperidine, perhydroazepine, perhydroazocine, perhydro-1,2-diazepine, perhydro-1,2,5-oxadiazepine, 2-pyrazoline, thiazolidine, perhydroindole, 1,2,3,3a,4,7,7a-heptahydroisoindole, 1,2,3,6-tetrahydropyridine, perhydroquinoline, perhydroisoquinoline, 1,4,5,6-tetrahydropyridazine, morpholine, thiomorpholine, thiomorpholine-1,1-dioxide, piperazine, pyrrole, pyrazole, imidazole, 1,2,3-triazole,

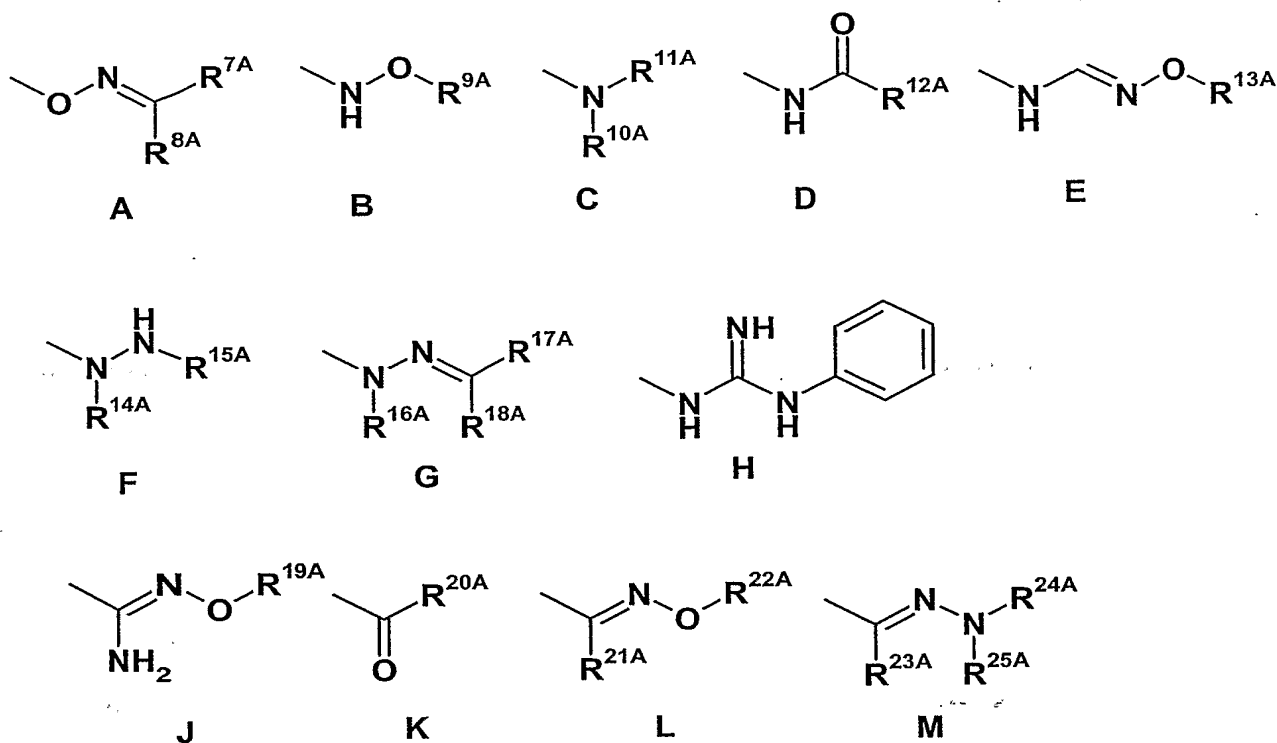
25

1,2,4-triazole, tetrazole and 1H-indazole and may be optionally substituted with 1-3 groups selected from the group consisting of fluoro, bromo, methyl, ethyl, n-propyl, fluoromethyl, trifluoromethyl, 2,2,2-trifluoroethyl, methoxy, methylthio, benzylthio, hydroxymethyl, 2-hydroxyethyl, methoxymethyl, anilinomethyl, difluoromethylene, dichloromethylene, methoxycarbonyl, ethoxycarbonyl, benzyloxycarbonyl, acetyl, trifluoromethylcarbonyl, trichloromethylcarbonyl, 1,1,2,2-tetrafluoroethylcarbonyl, perfluoroethylcarbonyl, perfluoroheptylcarbonyl, phenyl, benzyl, 2-pyridyl, hydroxy, oxo, cyano, carboxy, carbamoyl, ethoxycarbonylmethyl, methylcarbonylamino and trifluoromethylcarbonylamino,

$R^{3A}$  represents hydrogen, chloro, cyano, hydroxy, amino, azido, methyl, ethyl, iso-propyl, tert-butyl, trifluoromethyl, methoxymethyl, cyclopropyl, allyl, ethynyl, 1-propynyl, methoxy, ethoxy, n-propyloxy, n-butyloxy, 2,2,2-trifluoroethyloxy, allyloxy, 2-methyl-4-pentenlyoxy, 3-chloro-4,4,4-trifluoro-2-butenyloxy, methylthio, ethylthio, n- or iso-propylthio, n-, sec- or tert-butylthio, allylthio, 3,3-dichloroallylthio, methylsulfinyl, methylsulfonyl, phenoxy, benzyloxy, phenyl that may be optionally substituted with 1-2 groups selected from the group consisting of chloro, methyl, methoxy and trifluoromethyl, benzyl that may be optionally chloro-substituted, or phenoxymethyl that may be optionally chloro-substituted, or

$R^{3A}$  represents a heterocyclic group which is a monovalent group derived from a heterocycle selected from the group consisting of pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine, thiophene, thiazole, pyridine, quinoline, isoquinoline, pyrazine, pyridazine, pyrimidine, imidazole, pyrazole, tetrazole, 1,2,4-triazole and 2,3-dihydroindole, and may be optionally substituted by a group selected from the group consisting of chloro, bromo, methyl and trifluoromethyl, or

$R^{3A}$  represents a group selected from the group consisting of the following groups A-H and J-M



in which

$\text{R}^{7\text{A}}$  represents hydrogen atom, methyl or trifluoromethyl,

$\text{R}^{8\text{A}}$  represents methyl, iso- or tert-butyl, neo-pentyl, phenyl, ethoxy or cyano, or

5  $\text{R}^{7\text{A}}$  and  $\text{R}^{8\text{A}}$  form, together with the carbon atom to which they are bonded, cyclopentylidene or cyclohexylidene,

$\text{R}^{9\text{A}}$  represents methyl, 3,3-dichloroallyl or benzyl,

$\text{R}^{10\text{A}}$  represents hydrogen atom, methyl or ethyl,

10  $\text{R}^{11\text{A}}$  represents methyl, ethyl, iso-propyl, methoxyethyl, dimethylaminoethyl, phenyl, benzyl or cyano,

$\text{R}^{12\text{A}}$  represents methyl or phenyl,

$\text{R}^{13\text{A}}$  represents methyl or benzyl,

$\text{R}^{14\text{A}}$  represents hydrogen atom or methyl,

$\text{R}^{15\text{A}}$  represents hydrogen atom, 2,2,2-trifluoroethyl or phenyl,

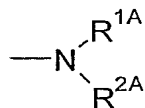
15  $\text{R}^{16\text{A}}$  represents hydrogen atom or methyl,

- $R^{17A}$  represents hydrogen atom, methyl or trifluoromethyl,
- $R^{18A}$  represents methyl or phenyl,
- $R^{19A}$  represents hydrogen atom or methyl,
- $R^{20A}$  represents methyl, ethyl, n- or iso-propyl,
- 5  $R^{21A}$  represents methyl or ethyl,
- $R^{22A}$  represents methyl, ethyl, n-propyl, n- or tert-butyl, allyl, 2-chloro-2-propenyl, 3-chloro-2-propenyl, 3,3-dichloro-2-propenyl, 2-methoxyethyl, 2-phenoxypropyl or tert-butoxycarbonylmethyl,
- $R^{23A}$  represents methyl,
- 10  $R^{24A}$  represents hydrogen atom or methyl,
- $R^{25A}$  represents iso-propyl or phenyl,
- $R^{24A}$  and  $R^{25A}$  form, together with the nitrogen atom to which they are bonded, a saturated-monoheterocyclic group which is a monovalent group derived from a monoheterocycle selected from the group consisting of pyrrolidine, piperidine, morpholine and piperazine and may be optionally substituted by methyl,
- 15  $R^{4A}$  represents hydrogen atom, chloro, cyano, methyl, trifluoromethyl, allyl, ethynyl, 1-propynyl, methoxy, 2,2,2-trifluoroethoxy, methylthio,  $C_{1-6}$ haloalkylthio, methylsulfinyl, methylsulfonyl or pyrazolyl that may be optionally methyl-substituted or trifluoromethyl-substituted,
- 20  $R^{5A}$  and  $R^{6A}$  each independently represents hydrogen atom, fluoro, methyl, ethyl, iso-propyl, trifluoromethyl or phenyl, and
- $Q^A$  represents naphthyl, phenyl that may be optionally substituted, pyridyl that may be optionally substituted, thienyl that may be optionally substituted, or furyl that may be optionally substituted, wherein substituents to phenyl, pyridyl, thienyl and furyl
- 25 are 1 to 5 groups selected from the group consisting of fluoro, chloro, methyl, tert-butyl, trifluoromethyl, methoxy, trifluoromethoxy, cyano, nitro, amino and phenyl,

provided that, the following cases (T-1)-(T-6) are excluded:

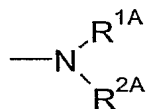
(T-1) the case in which group





5 represents 1-pyrrolyl, 1-imidazolyl, 3-oxopiperidino or 4-oxopiperidino,  $\text{R}^{3A}$  represents hydrogen atom,  $\text{R}^{4A}$  represents hydrogen atom, and  $\text{Q}^A$  represents 1-naphthyl or phenyl group that may be optionally substituted with 1 to 2 groups selected from the group consisting of chloro, methyl and trifluoromethyl,

(T-2) the case in which group

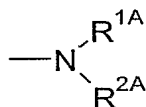


10

represents 3-oxopiperidino, 4-oxopiperidino, 4-hydroxypiperidino, 4-carbamoylpiperidino, 4-methylpiperazino, 4-ethylpiperazino, 4-(2-hydroxyethyl)piperazino or morpholino,  $\text{R}^{3A}$  represents amino,  $\text{R}^{4A}$  represents hydrogen atom, and  $\text{Q}^A$  represents 3-pyridyl or phenyl group that may be optionally substituted by one to three groups selected from the group consisting of fluoro, chloro, methyl, trifluoromethyl and methoxy,

15

(T-3) the case in which group

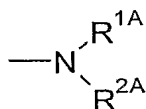


20

represents piperidino, 4-hydroxypiperidino, 4-methylpiperazino or morpholino,  $\text{R}^{3A}$  represents chloro, dimethylamino, anilino, piperidino, 4-methylpiperazino or morpholino,  $\text{R}^{4A}$  represents hydrogen atom, and  $\text{Q}^A$  represents phenyl group that may be optionally substituted by one or two groups selected from the group consisting of methyl and methoxy,

25

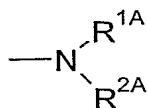
(T-4) the case in which group



represents 1-pyrrolidinyl, piperidino, morpholino or 1-pyrrolyl,  $R^{3A}$  represents methyl or methoxymethyl,  $R^{4A}$  represents chloro, and  $Q^A$  represents phenyl or 1-naphthyl,

(T-5) the case in which group

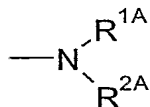
5



represents 1-azilidinyl, piperidino or morpholino,  $R^{3A}$  represents methylthio,  $R^{4A}$  represents chloro, and  $Q^A$  represents phenyl group substituted by methoxy,

(T-6) the case in which group

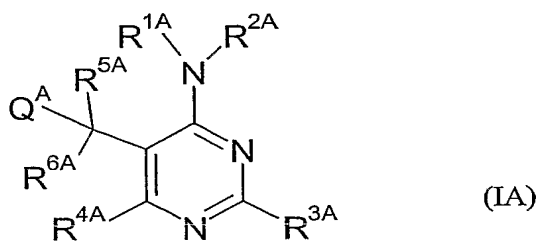
10



represents 1-azilidinyl,  $R^{3A}$  represents hydrogen atom or amino,  $R^{4A}$  represents chloro, and  $Q^A$  represents phenyl group substituted by methoxy.

15

5) A process for the preparations of the compounds of the formula (IA)



20

wherein

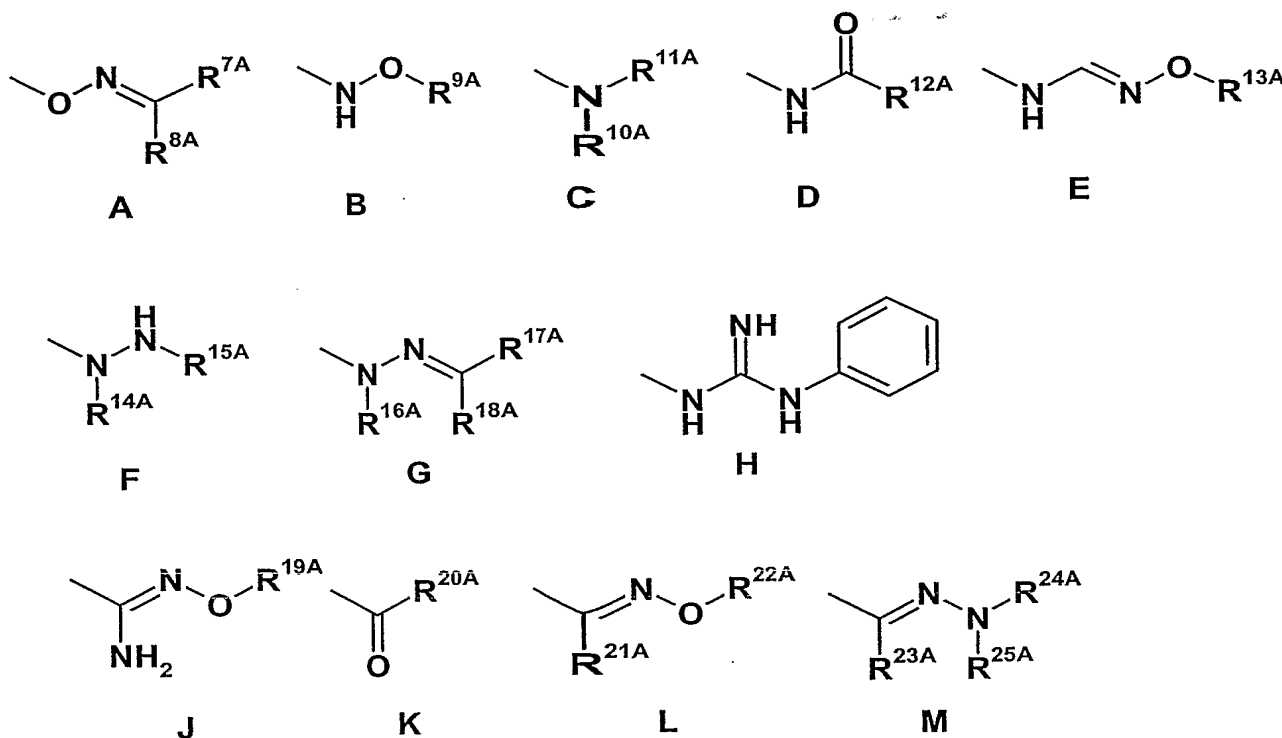
$R^{1A}$  and  $R^{2A}$  form, together with the nitrogen atom to which they are bonded, a 3 to 10-membered heterocyclic group that may be optionally substituted, and may contain further one to three hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and  $S(O)_m$ , besides the nitrogen atom to which  $R^{1A}$  and  $R^{2A}$  are bonded,

25

$m$  represents 0, 1 or 2,

$R^{3A}$  represents hydrogen, halogen, cyano, hydroxy, amino, azido, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, haloalkoxy, alkenyloxy, haloalkenyloxy, alkylthio, alkenylthio, haloalkenylthio, alkylsulfinyl, alkylsulfonyl, phenoxy that may be optionally substituted, benzyloxy that may be optionally substituted, phenyl that may be optionally substituted, phenylalkyl that may be optionally substituted, phenoxyalkyl that may be optionally substituted, or 5 to 10-membered heterocyclic group that contains one to four hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally substituted with a group selected from the group consisting of halogen, alkyl and haloalkyl, or

$R^{3A}$  represents a group selected from the group consisting of the following groups A-H and J-M



in which

$R^{7A}$  represents hydrogen atom, alkyl or haloalkyl, and

$R^{8A}$  represents alkyl, phenyl, alkoxy or cyano,

$R^{7A}$  and  $R^{8A}$  form, together with the carbon atom to which they are bonded, cycloalkylidene

or cyclohexylidene,

R<sup>9A</sup> represents alkyl, haloalkenyl or benzyl,

R<sup>10A</sup> represents hydrogen atom or alkyl,

R<sup>11A</sup> represents alkyl, alkoxyalkyl, dialkylaminoalkyl, phenyl, benzyl or cyano,

5 R<sup>12A</sup> represents alkyl or phenyl,

R<sup>13A</sup> represents alkyl or benzyl,

R<sup>14A</sup> represents hydrogen atom or alkyl,

R<sup>15A</sup> represents hydrogen atom, haloalkyl or phenyl,

R<sup>16A</sup> represents hydrogen atom or alkyl,

10 R<sup>17A</sup> represents hydrogen atom, alkyl or haloalkyl,

R<sup>18A</sup> represents alkyl or phenyl,

R<sup>19A</sup> represents hydrogen atom or alkyl,

R<sup>20A</sup> represents alkyl,

R<sup>21A</sup> represents alkyl,

15 R<sup>22A</sup> represents alkyl, alkenyl, haloalkenyl, alkoxyalkyl, phenoxyalkyl or  
alkoxycarbonylalkyl,

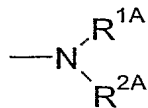
R<sup>23A</sup> represents alkyl,

R<sup>24A</sup> represents hydrogen atom or alkyl,

R<sup>25A</sup> represents alkyl or phenyl,

20 R<sup>24A</sup> and R<sup>25A</sup> form, together with the nitrogen atom to which they are bonded, a 5 to  
8-membered saturated-monoheterocyclic group that may be optionally substituted,  
and may contain further one or two hetero atoms selected from the group  
consisting of nitrogen atom, oxygen atom and S(O)<sub>n</sub>, besides the nitrogen atom to  
which R<sup>24A</sup> and R<sup>25A</sup> are bonded,

25 R<sup>4A</sup> represents hydrogen atom, halogen, cyano, alkyl, haloalkyl, alkenyl, alkynyl,  
alkoxy, haloalkoxy, alkylthio, haloalkylthio, alkylsulfinyl, alkylsulfonyl or group

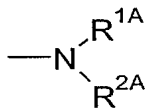


5  $\text{R}^{5A}$  and  $\text{R}^{6A}$  each independently represents hydrogen atom, halogen, alkyl, haloalkyl, or phenyl that may be optionally substituted, and

$\text{Q}^A$  represents aryl that may be optionally substituted or a 5 or 6-membered heterocyclic group that contains one hetero atom selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally substituted,

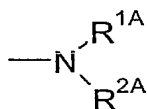
10 provided that, the following cases (T-1)-(T-6) are excluded:

(T-1) the case in which group



15 represents 1-indolyl, 1-pyrrolyl, 1-imidazolyl, 3-oxopiperidino or 4-oxopiperidino,  $\text{R}^{3A}$  represents hydrogen atom,  $\text{R}^{4A}$  represents hydrogen atom, and  $\text{Q}^A$  represents 1-naphthyl or phenyl group that may be optionally substituted by one or two groups selected from the group consisting of chloro, bromo, methyl, ethyl and trifluoromethyl,

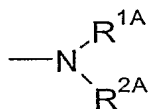
(T-2) the case in which group



20 represents 3-oxopiperidino, 4-oxopiperidino, 4-hydroxypiperidino, 4-carbamoylpiperidino, 4-methylpiperazino, 4-ethylpiperazino, 4-(2-hydroxyethyl)piperazino or morpholino,  $\text{R}^{3A}$  represents amino,  $\text{R}^{4A}$  represents hydrogen atom, and  $\text{Q}^A$  represents 3-pyridyl or phenyl group that may be optionally substituted by one to three groups selected from the group consisting of fluoro, chloro, bromo, methyl, ethyl, isopropyl, trifluoromethyl, hydroxy, methoxy and 4-chlorobenzyloxy,

25

(T-3) the case in which group

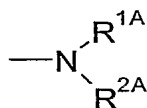


represents piperidino, 4-hydroxypiperidino, 4-methylpiperazino, morpholino, 6,7-dimethoxy-1,2,3,4-tetrahydroisoquinolin-2-yl or 6,7-dimethoxy-1-(3,4-dimethoxybenzyl)-1,2,3,4-tetrahydroisoquinolin-2-yl, R<sup>3A</sup> represents

chloro, dimethylamino, anilino, 2-(2-hydroxyethoxy)ethylamino, piperidino, 4-hydroxypiperidino, 4-carbamoylpiperidino, 4-methylpiperazino or morpholino,

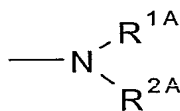
R<sup>4A</sup> represents hydrogen atom, and Q<sup>A</sup> represents phenyl group that may be optionally substituted by one or two groups selected from the group consisting of methyl and methoxy,

(T-4) the case in which group



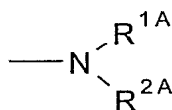
represents 1-pyrrolidinyl, piperidino, morpholino or 1-pyrrolyl, R<sup>3A</sup> represents methyl or methoxymethyl, R<sup>4A</sup> represents chloro, and Q<sup>A</sup> represents phenyl or 1-naphthyl,

(T-5) the case in which group



represents 1-azolidinyl, piperidino or morpholino, R<sup>3A</sup> represents methylthio, R<sup>4A</sup> represents chloro, and Q<sup>A</sup> represents phenyl group substituted by methoxy, ethoxy, n-propoxy, iso-propoxy, n-butoxy, iso-butoxy or allyloxy,

(T-6) the case in which group

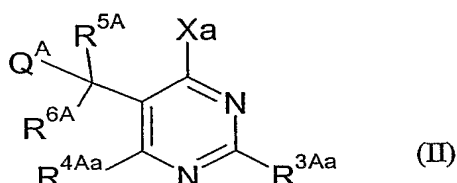


represents 1-azolidinyl,  $\text{R}^{3A}$  represents hydrogen atom or amino,  $\text{R}^{4A}$  represents chloro, and  $\text{Q}^A$  represents phenyl group substituted by methoxy, ethoxy or allyloxy,

characterized in that

- 5 a) In case that  $\text{R}^{3A}$  represents hydrogen, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, alkenyl, alkylthio, alkenylthio, haloalkenylthio, phenyl that may be optionally substituted, phenylalkyl that may be optionally substituted, phenoxyalkyl that may be optionally substituted, or 5 to 10-membered heterocyclic group that contains one to four hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally substituted by a group selected from the group consisting of halogen, alkyl and haloalkyl, and  $\text{R}^{4A}$  represents hydrogen atom, halogen, alkyl, haloalkyl or alkenyl:

compounds of the formula (II)



wherein

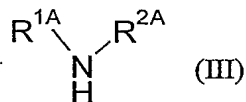
$\text{Xa}$  represents halogen, preferably chloro or bromo,

20  $\text{R}^{3Aa}$  represents hydrogen, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, alkenyl, alkylthio, alkenylthio, haloalkenylthio, phenyl that may be optionally substituted, phenylalkyl that may be optionally substituted, phenoxyalkyl that may be optionally substituted, or 5 to 10-membered heterocyclic group that contains one to four hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally substituted by a group selected from the group consisting of halogen, alkyl and haloalkyl, and

25  $\text{R}^{4Aa}$  represents hydrogen atom, halogen, alkyl, haloalkyl or alkenyl,

$\text{R}^{5A}$ ,  $\text{R}^{6A}$  and  $\text{Q}^A$  have the same definition as aforementioned,

are reacted with compounds of the formula (III)



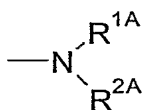
5                    wherein

$\text{R}^{1\text{A}}$  and  $\text{R}^{2\text{A}}$  have the same definition as aforementioned,

in the presence of inert solvents, and if appropriate, in the presence of an acid binder,

or

- 10            b)    in case that  $\text{R}^{3\text{A}}$  represents alkylsulfinyl or alkylsulfonyl and  $\text{R}^{4\text{A}}$  represents hydrogen atom, halogen, cyano, alkyl, haloalkyl, alkenyl, alkynyl, alkoxy, haloalkoxy or group



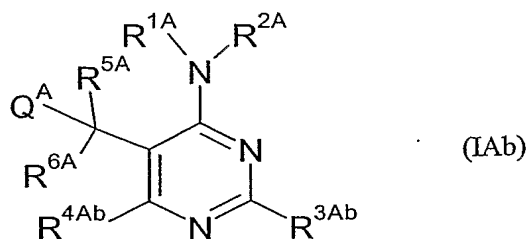
15                    or

$\text{R}^{3\text{A}}$  represents hydrogen, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, alkenyl, phenyl that may be optionally substituted, phenylalkyl that may be optionally substituted, phenoxyalkyl that may be optionally substituted, or 5 to 10-membered heterocyclic group that contains one to four hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally substituted by a group selected from the group consisting of halogen, alkyl and haloalkyl, and  $\text{R}^{4\text{A}}$  represents alkylsulfinyl or alkylsulfonyl:

20

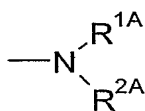


compounds of the formula (IAb)



wherein

R<sup>3Ab</sup> represents alkylthio, and R<sup>4Ab</sup> represents hydrogen atom, halogen, cyano, alkyl, haloalkyl, alkenyl, alkynyl, alkoxy, haloalkoxy or group



or

R<sup>3Ab</sup> represents hydrogen, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, alkenyl, phenyl that may be optionally substituted, phenylalkyl that may be optionally substituted, phenoxyalkyl that may be optionally substituted, or 5 to 10-membered heterocyclic group that contains one to four hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally substituted by a group selected from the group consisting of halogen, alkyl and haloalkyl, and R<sup>4Ab</sup> represents alkylthio,

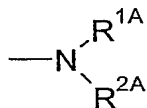
20 R<sup>1A</sup>, R<sup>2A</sup>, R<sup>5A</sup>, R<sup>6A</sup> and Q<sup>A</sup> have the same definition as aforementioned,

are reacted with an oxidizing agent in the presence of inert solvents,

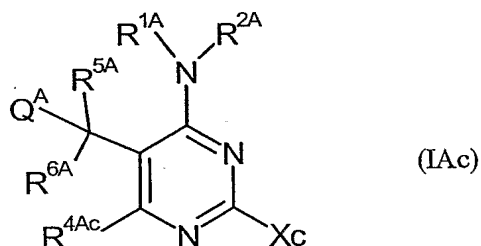
or,

c) in case that R<sup>3A</sup> represents cyano, hydroxy, azido, alkynyl, alkoxy, haloalkoxy, alkenyloxy, haloalkenyloxy, alkylthio, alkenylthio, haloalkenylthio, phenoxy that may be optionally substituted, benzyloxy that may be optionally substituted, or 5 to 10-membered heterocyclic group that contains one to four hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally substituted by a group selected from the group consisting of halogen, alkyl and haloalkyl, or represents the aforementioned group A, group B, group C, group F, group G or group H, and

$R^{4A}$  represents hydrogen atom, halogen, alkyl, haloalkyl, alkenyl, alkynyl, alkoxy, haloalkoxy, cyano or group



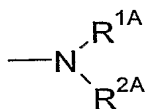
5 compounds of the formula (IAc)



10 wherein

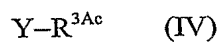
$Xc$  represents halogen, preferably chloro, bromo or iodo, or methylsulfonyl,

$R^{4Ac}$  represents hydrogen atom, halogen, alkyl, haloalkyl, alkenyl, alkynyl, alkoxy, haloalkoxy, cyano or group



15  $R^{1A}$ ,  $R^{2A}$ ,  $R^{5A}$ ,  $R^{6A}$  and  $Q^A$  have the same definition as aforementioned,

are reacted with compounds of the formula (IV)



wherein

20  $Y$  represents hydrogen, sodium, potassium, copper, trimethylsilyl or tetraalkylammonium,

$R^{3Ac}$  represents cyano, hydroxy, azido, alkynyl, alkoxy, haloalkoxy, alkenyloxy, haloalkenyloxy, alkylthio, alkenylthio, haloalkenylthio, phenoxy that may

5

be optionally substituted, benzyloxy that may be optionally substituted, or 5 to 10-membered heterocyclic group that contains one to four hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally substituted by a group selected from the group consisting of halogen, alkyl and haloalkyl, or represents the

in the presence of inert solvents, and if appropriate, in the presence of an acid binder, and if appropriate, in the presence of a catalyst,

or

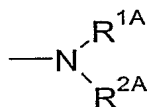
10

- d) in case that  $R^{3A}$  represents hydrogen, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, alkenyl, alkylthio, alkenylthio, haloalkenylthio, phenyl that may be optionally substituted, phenylalkyl that may be optionally substituted, phenoxyalkyl that may be optionally substituted, or 5 to 10-membered heterocyclic group that contains one to four hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally substituted by a group selected from the group consisting of halogen, alkyl and haloalkyl, and

15

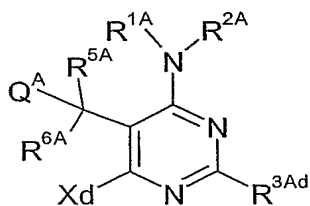
$R^{4A}$  represents cyano, alkynyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio or group

20



compounds of the formula (IAd)

25



(IAd)

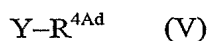
wherein

$X_d$  represents halogen, preferably chloro, bromo or iodo, or methylsulfonyl,

$R^{3Ad}$  represents hydrogen, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, alkenyl, alkylthio, alkenylthio, haloalkenylthio, phenyl that may be optionally substituted, phenylalkyl that may be optionally substituted, phenoxyalkyl that may be optionally substituted, or 5 to 10-membered heterocyclic group that contains one to four hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally substituted by a group selected from the group consisting of halogen, alkyl and haloalkyl,

$R^{1A}$ ,  $R^{2A}$ ,  $R^{5A}$ ,  $R^{6A}$  and  $Q^A$  have the same definition as aforementioned,

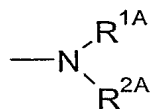
are reacted with compounds of the formula (V)



wherein

$Y$  represents hydrogen, sodium, potassium, copper, trimethylsilyl or tetraalkylammonium,

$R^{4Ad}$  represents cyano, alkynyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, or group



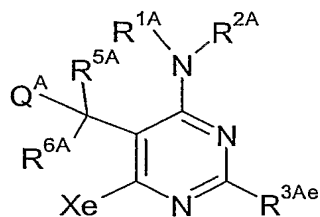
in the presence of inert solvents, and if appropriate, in the presence of an acid binder, and if appropriate, in the presence of a catalyst,

or

e) in case that  $R^{3A}$  represents hydrogen, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, alkylthio, phenyl that may be optionally substituted, phenylalkyl that may be optionally substituted, phenoxyalkyl that may be optionally substituted, or 5 to 10-membered heterocyclic group that contains one to four hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally substituted by a group selected from the group consisting of halogen, alkyl and haloalkyl, and

$R^{4A}$  represents hydrogen:

compounds of the formula (IAe)



(IAe)

wherein

Xe represents halogen, preferably chloro, bromo or iodo,

R<sup>3Ae</sup> represents hydrogen, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, alkylthio, phenyl that may be optionally substituted, phenylalkyl that may be optionally substituted, phenoxyalkyl that may be optionally substituted, or 5 to 10-membered heterocyclic group that contains one to four hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally substituted by a group selected from the group consisting of halogen, alkyl and haloalkyl,

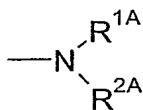
R<sup>1A</sup>, R<sup>2A</sup>, R<sup>5A</sup>, R<sup>6A</sup> and Q<sup>A</sup> have the same definition as aforementioned,

are hydrogenated in the presence of inert solvents, and if appropriate, in the presence of a catalyst, and if appropriate, in the presence of an acid binder,

or

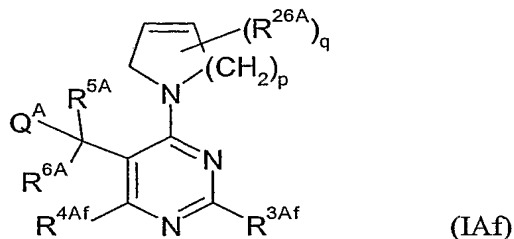
f) in case that R<sup>3A</sup> represents hydrogen, halogen, cyano, hydroxy, amino, azido, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, alkynyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, alkylsulfinyl, alkylsulfonyl, phenoxy that may be optionally substituted, benzyloxy that may be optionally substituted, phenyl that may be optionally substituted, phenylalkyl that may be optionally substituted, phenoxyalkyl that may be optionally substituted, or 5 to 10-membered heterocyclic group that contains one to four hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally substituted by a group selected from the group consisting of halogen, alkyl and haloalkyl, or the aforementioned groups A-H or groups J-M,

R<sup>4A</sup> represents hydrogen atom, halogen, cyano, alkyl, haloalkyl, alkynyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, alkylsulfinyl, alkylsulfonyl, or group



compounds of the formula (IAf)

5



wherein

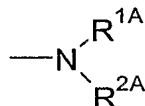
10

$R^{3Af}$  represents hydrogen, halogen, cyano, hydroxy, amino, azido, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, alkynyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, alkylsulfinyl, alkylsulfonyl, phenoxy that may be optionally substituted, benzyloxy that may be optionally substituted, phenyl that may be optionally substituted, phenylalkyl that may be optionally substituted, phenoxyalkyl that may be optionally substituted, or 5 to 10-membered heterocyclic group that contains one to four hetero atoms selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom and may be optionally substituted by a group selected from the group consisting of halogen, alkyl and haloalkyl, or the aforementioned groups A-H or groups J-M,

15

20

$R^{4Af}$  represents hydrogen atom, halogen, cyano, alkyl, haloalkyl, alkynyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, alkylsulfinyl, alkylsulfonyl, or group



$R^{5A}$ ,  $R^{6A}$  and  $Q^A$  have the same definition as aforementioned,

25

$R^{26A}$  represents alkyl, p - represents 1 or 2, q represents 0, 1 or 2,

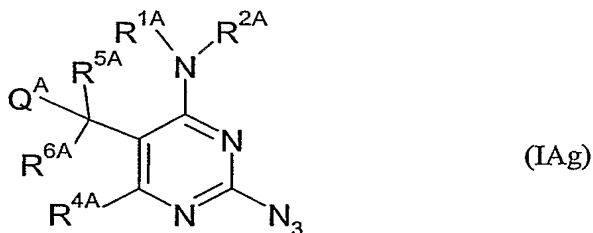
are reacted with difluorocarbene derived from sodium chlorodifluoroacetate or with dichlorocarbene derived from chloroform, in the presence of inert solvents, and if appropriate, in the presence of a phase -

transfer catalyst,

or

g) in case that  $R^{3A}$  represents amino:

compounds of the formula (IAg)



wherein

$R^{1A}$ ,  $R^{2A}$ ,  $R^{4A}$ ,  $R^{5A}$ ,  $R^{6A}$  and  $Q^A$  have the same definition as aforementioned,

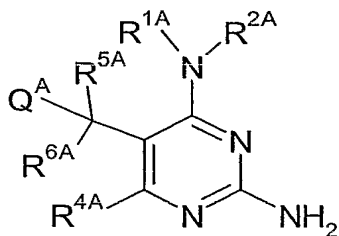
10 are hydrogenated or reacted with metal hydride in the presence of inert solvents, and if appropriate, in the presence of a catalyst,

or

h) in case that  $R^{3A}$  represents halogen:

First step:

15 compounds of the formula (IAh)



wherein

$R^{1A}$ ,  $R^{2A}$ ,  $R^{4A}$ ,  $R^{5A}$ ,  $R^{6A}$  and  $Q^A$  have the same definition as aforementioned,

20 are reacted with nitrite ester or nitrous acid in the presence of inert solvents, and if appropriate, in the presence of acid catalyst to form a diazonium salt,

Second step:

The diazonium salts obtained in the above-mentioned first step is reacted according to Sandmeyer process or Gattermann process in the presence of copper halide , potassium halide or copper powder,

in the presence inert solvents, and if appropriate, in the presence of acid catalyst,

or

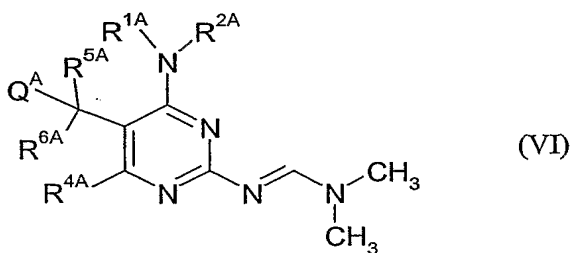
- i) in case that  $R^{3A}$  represents the aforementioned group E:

First step:

compounds of the aforementioned formula (IAh) are reacted with dimethylformamide dimethylacetal in the presence of inert solvents,

Second step:

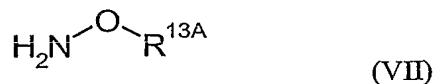
compounds of the formula (VI), obtained in the above-mentioned first step,



wherein

$R^{1A}$ ,  $R^{2A}$ ,  $R^{4A}$ ,  $R^{5A}$ ,  $R^{6A}$  and  $Q^A$  have the same definition as aforementioned,

are reacted with compounds of the formula (VII)



wherein

$R^{13A}$  has the same definition as aforementioned,

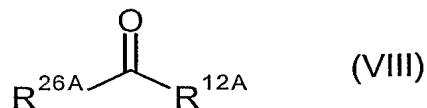
in the presence of inert solvents, and if appropriate, in the presence of an acid binder, and if appropriate, in the presence of an acid catalyst,

or



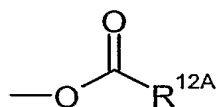
j) in case that  $R^{3A}$  represents the aforementioned group D:

compounds of the formula (IAh) are reacted with compounds of the formula (VIII)



wherein

$R^{26A}$  represents chloro or group



wherein

$R^{12A}$  has the same definition as aforementioned,

in the presence of inert solvents, and if appropriate, in the presence of an acid binder,

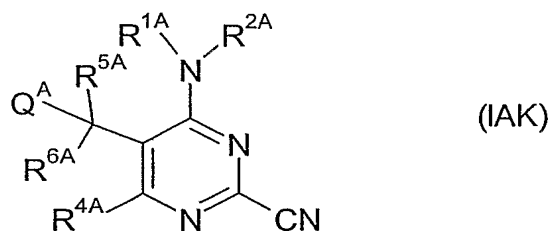
or

k) In case that  $R^{3A}$  represents the aforementioned group K, and

$R^{4A}$  represents hydrogen atom, halogen, alkyl, haloalkyl, alkenyl, alkynyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, alkylsulfinyl, alkylsulfonyl, or group

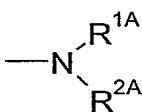


compounds of the formula (IAk)



wherein

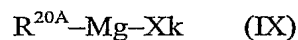
$R^{4A}$  represents hydrogen atom, halogen, alkyl, haloalkyl, alkenyl, alkynyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, alkylsulfinyl, alkylsulfonyl, or group



and

$R^{1A}$ ,  $R^{2A}$ ,  $R^{5A}$ ,  $R^{6A}$  and  $Q^A$  have the same definition as aforementioned,

are reacted with compounds of the formula (IX)



wherein

$Xk$  represents halogen, preferably chloro, bromo or iodo,

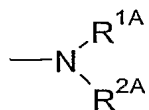
$R^{20A}$  has the same definition as aforementioned,

in the presence of inert solvents,

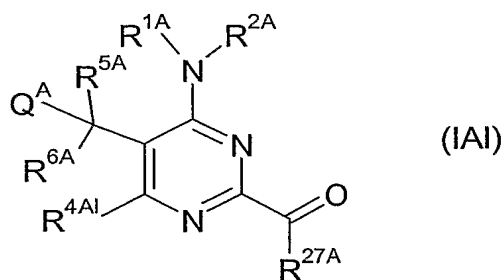
or

1) In case that  $R^{3A}$  represents the aforementioned group L or group M, and

$R^{4A}$  represents hydrogen atom, halogen, alkyl, haloalkyl, alkenyl, alkynyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, alkylsulfinyl, alkylsulfonyl, or group



compounds of the formula (IAI)

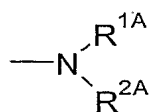


5

wherein

$\text{R}^{27A}$  represents alkyl,

$\text{R}^{4AI}$  represents hydrogen atom, halogen, alkyl, haloalkyl, alkenyl, alkynyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, alkylsulfinyl, alkylsulfonyl, or group

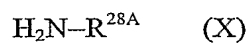


10

and

$\text{R}^{1A}$ ,  $\text{R}^{2A}$ ,  $\text{R}^{5A}$ ,  $\text{R}^{6A}$  and  $\text{Q}^A$  have the same definition as aforementioned,

are reacted with compounds of the formula (X)



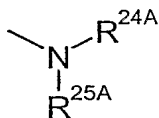
wherein

15

$\text{R}^{28A}$  represents group



or group

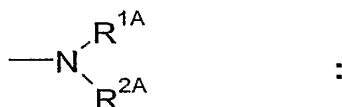


wherein

$\text{R}^{22\text{A}}$ ,  $\text{R}^{24\text{A}}$ , and  $\text{R}^{25\text{A}}$  have the same definition as aforementioned,

5 in the presence of inert solvents, and if appropriate, in the presence of acid binder, and if appropriate, in the presence of acid catalyst,

or



m) in case that  $\text{R}^{3\text{A}}$  represents the aforementioned group J, and

compounds of the formula (IAk) are reacted with compounds of the formula (XI)

10  $\text{H}_2\text{NO}-\text{R}^{19\text{A}}$  (XI)

wherein

$\text{R}^{19\text{A}}$  has the same definition as aforementioned,

in the presence of inert solvents, and if appropriate, in the presence of acidbinder, and if appropriate, in the presence of acid catalyst.

- 15 6) Process for combating undesired microorganisms, characterized in that benzylpyrimidine derivatives of the formula (I) according to claim 1 are applied to the microorganisms and / or their habitat.
- 7) An agrohorticultural fungicide comprising a benzylpyrimidine derivative of the formula (I) according to claim 1, and -optionally- extenders and/or carriers and/or surfactants and/or
- 20 further formulation antiliaries.
- 8) Process for the preparation of microbicidal compositions, characterized in that benzylpyrimidine derivatives of the formula (I) according to claim 1 are mixed with extends and / or surface active agents.